National Aeronautics and
Space Administration

NOT MEASUREMENT
SENSITIVE

NASA-STD-2804I
effective date 17 May 2005

# MINIMUM INTEROPERABILITY SOFTWARE SUITE

# NASA TECHNICAL STANDARD

# FOREWORD

This standard is approved for use by NASA Headquarters and all NASA Centers and is intended to provide a common framework for consistent practices across NASA programs.

The material covered in this standard is based on the consensus judgment of the NASA Chief Information Officers (CIO) Board and the NASA IT Investment Council. The purpose of this standard is to establish the minimum workstation software suite required to support interoperability, establish interface and product standards for components of the software suite operating on PC, Macintosh, and Unix systems, and establish reporting metrics for determining overall NASA interoperability.

Requests for information, corrections, or additions to this standard should be directed to the John H. Glenn Research Center at Lewis Field (GRC), the Basic Interoperability and Desktop Standards Group, Code 7100, MS 142-5, Cleveland, OH, 44135 or to *desktop-standards@grc.nasa.gov*. Requests for general information concerning standards should be sent to NASA Technical Standards Program Office, ED41, MSFC, AL, 35812 (telephone 256-544-2448). This and other NASA standards may be viewed and downloaded, free of charge, from our NASA Standards web page: *http://standards.nasa.gov/*.

Patricia L. Dunnington
Chief Information Officer

CONTENTS

# 1 SCOPE

## 1.1 Purpose and Scope

This standard establishes the minimum software suite required to support interoperability; establishes interface and product standards for components of the software suite operating on PC, Macintosh, and Unix systems; and establishes reporting metrics for determining overall NASA interoperability.

## 1.2 Applicability

Center CIO's will ensure that all NASA employees at their respective centers have access to an interoperable workstation that is equipped with a minimum software suite that meets the standards listed in Section 3 below.

For the functions (components) identified with standard products, future procurements to support interoperability are restricted to these products and enterprise applications. Licenses for other products may not be renewed. Additional products will be added as required.

## 1.3 Waivers

The waiver process set forth in NPR 2800.1, paragraph 2.2.4, applies to this standard. The desktop standards group, in cooperation with the Chief Technical Officer, will continue to process waivers on behalf of the Principal Center for Workgroup Hardware and Software.

# 2 ACRONYMS AND DEFINITIONS

## 2.1 Acronyms

| | |
|---|---|
| CIO | Chief Information Officer |
| FTP | File Transfer Protocol |
| GIF | Graphics Interchange Format |
| HTML | HyperText Markup Language |
| ICA | Independent Computing Architecture |
| ICE | Integrated Cryptographic Engine |
| JPEG | Joint Photographic Experts Group |
| JRE | Java Runtime Environment |
| MIME | Multipurpose Internet Mail Extension |
| PDF | Portable Document Format |
| PKI | Public Key Infrastructure |
| SMTP | Simple Mail Transport Protocol |
| TCP/IP | Transmission Control Protocol/Internet Protocol |

## 2.2 Definitions

### 2.2.1 Minimum Workstation to Support Basic Interoperability

Workstations that support basic interoperability are defined by being networked, and by having users who exchange information electronically, including those users that perform any or all of the activities encompassed in the minimum office automation software suite defined below.

# 3 DETAILED REQUIREMENTS

## 3.1 Architectural Compliance Requirements

NASA has baselined and approved an initial NASA Integrated Information Technology Architecture[1]. The architecture is predicated on:

- the selection of standards for a broad and cost-effective infrastructure using commercial off-the-shelf and well-supported open source products as much as possible
- interoperability both within and external to NASA
- flexibility for future growth
- consistency with generally accepted consensus standards as much as feasible.

Among these objectives, interoperability is one of NASA's most critical issues related to information technology.

At times, it is in NASA's best interest to specify commercial products as standards for an interoperable implementation of a particular set of related and integrated functions. In those instances, there are often other embedded functions or proprietary extensions within those products whose use may create higher-level interoperability conflicts when embedded in an application system that transcends basic interoperability. **For that reason, NASA Centers and programs are advised to apply appropriate caution when using proprietary or non-standard extensions, features and functions of hardware or software that go beyond the standard functionality**.

## 3.2 Interface and Product Standards.

The following standards are established for the components of the basic interoperability software suite:

| Component | Interface standard | Product standard |
|---|---|---|
| Word processing | Microsoft Word file[2] | Microsoft Word |
| Spreadsheet | Microsoft Excel file | Microsoft Excel |
| Presentation | Microsoft PowerPoint file | Microsoft PowerPoint |
| Electronic mail | NASA-STD-2815, *Electronic messaging architecture, standards and products*, which references RFC1939 (POP3) and RFC2060 (IMAP4). | Windows: Microsoft Outlook, Eudora Pro 6.2<br>Mac OS X: Eudora Pro 6.2<br>MS Entourage 2004<br>Unix: Mozilla Thunderbird 1.0.2 (or later) |
| Web browser | W3C and industry standards, including the following:<br>HTML 4.01<br>XHTML 1.0<br>CSS (Cascading Style Sheets)<br>ECMAscript (JavaScript)<br>capability to run Java 2 applets<br>SSL version 2 and 3 using 128 bit RC4 encryption and the MD5 message digest algorithm. See | Windows: Internet Explorer 6 and Mozilla Firefox 1.0.4 (or later)<br>Mac OS X: Internet Explorer 5.2.3 and Mozilla Firefox 1.0.4, and Safari 1.3 (or later)<br>Other Unix: Mozilla Firefox 1.0.4 (or later) |

[1] NASA-STD-2814A, *NASA Integrated Information Technology Architecture—Technical Framework*
[2] The Microsoft Office file formats are the ones used in Office 97. Office 2000, Office XP, and Office 2003/2004 use this same format.

| Component | Interface standard | Product standard |
|---|---|---|
| | NASA-STD-2820, *Encryption and Digital Signature Standards*. | |
| PDF viewer | PDF file | Adobe Reader (6.0 or higher) or other comparable PDF viewer |
| Calendar/scheduling | iCalendar (RFC 2445)[3] | none specified[4] |
| Access to centrally-served Windows applications | Citrix ICA protocol | Citrix ICA client<br>Windows: 8.x<br>Mac OS X 7.x |
| Electronic forms | NASA-STD-2809, *NASA Intelligent Electronic Forms* | FileNet Desktop eForms 4.2 |
| Patch reporting | PatchLink proprietary | PatchLink Update 6 |
| Other software components | see tables I and II | see tables I and II |

## 3.3 Operating System Standards and Compliance Dates

### 3.3.1 Microsoft Windows

Windows XP Professional shall be completely deployed by June 30, 2005. Windows XP service pack 2 shall be completely deployed by September 30, 2005.

Windows XP Home Edition shall not be deployed.

Versions of Windows prior to Windows XP Professional should not be running on any agency interoperable Windows system after June 30, 2005.

### 3.3.2 Mac OS

Mac OS X 10.3.9 (or later) should now be completely deployed on all interoperable Macintosh systems.

Mac OS 9 may continue to be installed along with Mac OS X to support the Classic environment, but systems should not be configured to boot into Mac OS 9.

Versions of Mac OS X prior to 10.3 should not be running on any agency interoperable Macintosh systems.

### 3.3.3 Unix

Unix systems with no interoperability requirement do not need to comply with the interoperability requirements in this standard. Such systems would include special-purpose Unix systems such as name servers, compute servers, data acquisition systems, or other components of the overall computing environment.

Several product standards are not available for any Unix system. In order to comply with this standard, interoperable Unix desktops must have some way to access these products. One way to accomplish this would be to use a Citrix ICA client to connect to a Microsoft Windows application server.

[3] Limited interoperability provided by this standard.
[4] All center CIO's are responsible for providing an interoperable calendar/scheduling solution within their centers.

The following Unix systems are supported in the NASA interoperable computing environment. Generally, both the current version and prior version of the operating system are acceptable. However, the older version of the operating system must continue to be supported by the vendor, and like all systems, must be kept up-to-date with security patches.

#### 3.3.3.1 Sun Solaris/SPARC

Solaris is at version 10. Information about supported Solaris releases may be found at:

http://www.sun.com/software/solaris/faqs/general.jsp#releases

#### 3.3.3.2 SGI IRIX/MIPS

IRIX 6.5.27 is current. IRIX update releases are made quarterly, and generally IRIX systems should be kept up-to-date with these maintenance updates.

Versions of IRIX prior to 6.5 are not supported in the agency interoperable environment.

SGI provides information about IRIX releases at:

*http://www.sgi.com/software/irix/releases/*

#### 3.3.3.3 Red Hat Linux/x86

Red Hat Enterprise Linux WS 4 is the current version and is described at:

*http://www.redhat.com/software/rhel/ws*

Note that prior versions of Red Hat Linux (such as Red Hat 7 through 9) are no longer vendor supported, and should not be installed on interoperable desktop machines.

#### 3.3.3.4 IBM AIX/POWER

AIX 5L 5.2 and 5.3 are current. AIX versions are described at:

*http://www-1.ibm.com/servers/aix/os/index.html*

#### 3.3.3.5 HP Tru64/Alpha

Tru64 Unix 5.1B-2 is current.

The future roadmap for Tru64 Unix from HP indicates support until at least 2006. HP proposes migration to HP-UX on Itanium. Additional details can be found at:

*http://h30097.www3.hp.com*

#### 3.3.3.6 HP HP-UX/PA-RISC

HP-UX 11i v2 is current. The HP-UX 11i web page is at:

*http://www.hp.com/products1/unix/operating/index.html*

### 3.4 Microsoft Office Compliance Dates.

Microsoft Office deployment deadlines for all interoperable Windows and Mac OS systems are as follows:

#### 3.4.1 Microsoft Windows

Microsoft Office 2003 Standard Edition shall be completely deployed by June 30, 2005. Centers using Outlook as an email client should deploy Outlook 2003.

Microsoft Office XP and earlier versions shall be removed by June 30, 2005.

#### 3.4.2 Mac OS

Microsoft Office 2004 Standard shall be completely deployed on Mac OS X systems by June 30, 2005. Centers using Entourage as a mail client should deploy Entourage 2004.

Microsoft Office v. X and earlier versions shall be removed by June 30, 2005.

### 3.5 Operating System Configuration Guidelines

The Federal Information Security Management Act (FISMA) requires all Federal agencies to utilize a consistent set of operating system and application configuration guidelines. Agency-wide guidance is provided in the NASA CIO letter, *Center for Internet Security (CIS) Consensus Benchmarks,* dated 02 September 2004 in which Centers are directed to use the Center for Internet Security's (CIS) Consensus Benchmarks. Technical guidance regarding specific levels of CIS Benchmarks for NASA systems are being worked and will be made available at:

http://desktop-standards.grc.nasa.gov/CIS

### 3.6 Section 508 Compliance Requirements

Software products procured after June 21, 2001 must be in conformance with Section 508 of the Rehabilitation Act. Complete information and guidance on addressing Section 508 requirements is available at:

http://www.section508.nasa.gov

### 3.7 FIPS 140-2 Compliance Requirements

NASA will adhere to the guidelines and recommendations of the National Institute of Standards and Technology as required by the Federal Information Security Management Act, particularly as they apply to computer security and encryption technology for desktop hardware and software. More specifically, NASA will comply with Federal Information Processing Standards (FIPS) 140-1 and 140-2 as applicable, validated encryption modules become available.

NASA application developers and service providers are reminded that whenever cryptographic-based security systems are used to protect sensitive information in computer systems, the

cryptographic modules utilized must be FIPS 140-2 compliant as validated by NIST[5]. A current list of validated products can be found at:

http://csrc.nist.gov/cryptval/

The following products mentioned in NASA-STD-2804 have been validated by a NIST-accredited testing laboratory and may be appropriate to protect sensitive information with cryptography under specific conditions:

| Product | Validation Module | Certification | Comments |
|---|---|---|---|
| Microsoft Internet Explorer | Kernel Mode Cryptographic Module for Windows XP | #241 | Single User Mode, FIPS 140-1 |
| Microsoft Outlook | Outlook Cryptographic Provider | #110 | Single User Mode, FIPS 140-1, S/MIME |
| Entrust PKI Software | Entrust Security Kernel Version 7.0 | #308 | FIPS 140-1, When operated in FIPS Mode |
| F-Secure SSH | F-Secure® Cryptographic Library™ for Windows | #437 | FIPS 140-2, When operated in FIPS Mode, Single User Mode. |
| Citrix ICA Client for Windows | Kernel Mode Cryptographic Module for Windows XP | Not Validated | Uses MS Windows FIPS Crypto Module |

### 3.8 Future Interface and Product Standards.

The NASA desktop standards group is working to ensure interoperability at the highest possible revision of products included in the interoperability software suite. Systems conforming to the interface and product standards defined herein will meet any future interoperability requirements established by the Agency CIO.

## 4 REVIEW AND REPORTING REQUIREMENTS

### 4.1 Interoperability Maintenance Reporting

Each Center CIO will provide the NASA CIO with an annual progress report, outlining the progress in maintaining minimum interoperability access for each NASA employee.

### 4.2 Interoperability Reporting

Each Center CIO will establish the necessary processes and tools, both manual and automated, to report on an annual basis to the NASA CIO the hardware and software configuration of all workstations at their respective Centers. These data will contain sufficient information to ascertain if the workstation supports NASA employees or is Government-furnished equipment to a contractor, whether the equipment is required to be interoperable, and a description of the hardware architecture/environment. The report will specify the number of NASA employees that do not have access to interoperable workstations.

### 4.3 Interface and Product Standards Review Reporting

This standard will be reviewed and updated on an as-required basis, not to exceed 6-month intervals. Office automation software standards will be updated as required.

[5] Federal Information Processing Standards Publication 140-2, *Security Requirements for Cryptographic Modules*

# 5 DURATION

## 5.1 Duration

This standard will remain in effect until canceled or modified by the NASA CIO.

# 6 SUPPORTING DOCUMENTS

## 6.1 Supporting Documents

Supporting documents and additional information related to this standard may be found at:

http://desktop-standards.grc.nasa.gov

**Table I—Other required functionality**

| Feature | Recommended software, by platform | | |
|---|---|---|---|
| | Windows | Mac OS X | Unix |
| ftp client | FTP Commander 7.33 | Fetch 4.0.3 | bundled |
| news reader | Mozilla Thunderbird | Mozilla Thunderbird | Mozilla Thunderbird |
| viewer for GIF and JPEG images | bundled | bundled | use web browser |
| File archive extractor/creator | WinZip 9 | StuffIt Standard | InfoZIP |
| anti-virus software | Symantec Anti-virus | Symantec Anti-virus | F-Prot Antivirus |
| anti-spyware software | TBD | not required | not required |
| Audio/video players | QuickTime 6.5 | bundled QuickTime 6.5 | xanim (limited functionality) |
| | RealPlayer 10 | RealPlayer 10 | RealPlayer Basic |
| | Windows Media Player 10 | Windows Media Player 9 | not available |
| Macromedia Flash player | Macromedia Flash Player 7 | Macromedia Flash Player 7 | Macromedia Flash Player 6 (Except Irix, which is still only at version 4) |
| Macromedia Shockwave player | Macromedia Shockwave 10 | Macromedia Shockwave 10 | not available |
| Macromedia Authorware player | Macromedia Authorware Web player 7 Full | Macromedia Authorware Web player 7 Complete | not available |
| Java run-time environment | Sun JRE 1.4[6] | Sun JRE 1.4 (bundled) | Sun JRE 1.4 |
| Web conferencing | WebEx | WebEx | WebEx |
| PKI software | see table III, PKI software | | |

Note that Table I specifies only **functionality**. Software products and versions other than the ones listed in the table may be used to provide the required functionality.

[6] At the time of this writing, the most current Java 1.4 release is 1.4.2_07, but this may vary slightly by platform.

**Table II—Optional useful functionality not required for interoperability**

| Feature | Recommended software, by platform | | |
|---|---|---|---|
| | Windows | Mac OS X | Unix |
| ssh client[7] | F-Secure SSH | bundled | bundled or OpenSSH |
| secure file transfer | FileZilla | RBrowser | bundled or OpenSSH scp/sftp |
| 3270 client | QWS3270 4.0 | tn3270 X 3.1.1 | x3270 3.3.2p1 |
| PC emulation | VMware Workstation 4.5 | VirtualPC 7 | VMware Workstation 4.5 |
| Windows application execution environments | | | CrossOver Office |
| X window system server | Exceed 10 | Apple X11 | bundled |
| PostScript previewer | Ghostscript | bundled | Ghostscript |
| PDF writer | Adobe Acrobat 7 | bundled | Ghostscript (ps2pdf) |
| Data conferencing/T.120 client | Microsoft NetMeeting | No recommendation | SunForum (Sun), SGImeeting (SGI) |
| Business graphics | Visio 2003 | OmniGraffle Professional | No recommendation |
| Project Management | MS Project 2003 | No recommendation | No recommendation |

[7] A client which supports SSH protocol version 2 is required.

**Table III—PKI software**

| Component | Version, by platform | | |
|---|---|---|---|
| | Windows | Mac OS X | Unix |
| Entrust Entelligence | 7.0 | 6.2.1 (build 174) | not available |
| Entrust Express | | | |
| for Eudora | Entrust Express 7.0 for Eudora (Eudora 6.0 or higher) | Entrust Express for Eudora (Eudora 6.0 or higher) | not applicable |
| for Microsoft Outlook | Entrust Express 7.0 for Outlook | not available | not applicable |
| ICE (with True Delete) | 7.0 | not available | not available |
| Entrust Direct[8] | 6.1 or TruePass 7.0 | TruePass 7.0 | not available |

[8] Entrust Direct supports only specific versions of Netscape and Internet Explorer. Contact the NASA PKI team for an up-to-date list.